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NOTES ON GEOGRAPHIC DISTRIBUTION

Amphibia, Anura, Cycloramphidae, *Proceratophrys moratoi* (Jim and Caramaschi, 1980): Distribution extension and new altitudinal record in state of São Paulo, Brazil

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ABSTRACT: Here we present a new record of the little toad *Proceratophrys moratoi* for the state of São Paulo, in the municipality of Bauru. This record extends to the known distribution of *P. moratoi* around 80 km northwestern from its type locality and around 115 km west from other known populations of this species. It also corresponds to the lowest elevation where the species has been found, approximately 200 m altitude below the known records.

Proceratophrys moratoi was described by Jim and Caramaschi (1980) as *Odontophrynus moratoi* in the district of Rubião Júnior, municipality of Botucatu, state of São Paulo, southeastern Brazil. Recently, Amaro *et al.* (2009) have performed molecular analyses with *O. moratoi*, which was then inserted into the genus *Proceratophrys*.

This species is characterized by its small size (male 27.6 mm and female 35.7 mm of snout-vent length), and occurs in open areas adjacent to small streams, with herbaceous vegetation where bushes predominate among some scattered trees (Jim and Caramaschi 1980). *Proceratophrys moratoi* is endemic to Cerrado from state of São Paulo (Garcia *et al.* 2009), a biome that originally occupied 14 % (3.4 million hectares) of the state and currently occupies only 0.84 % (211 thousand hectares) of it (Secretaria do Meio Ambiente do Estado de São Paulo 2008a).

According to the Brazilian Red List of Threatened Species, *P. moratoi* is considered "critically endangered" (Machado *et al.* 2008). In the state of São Paulo, a recent review of the List of Threatened Species of the state reclassified it from "critically endangered" to "vulnerable" (Secretaria do Meio Ambiente do Estado de São Paulo 2008b). Since its description, *P. moratoi* has only been recorded in the municipality of Botucatu, state of São Paulo, Brazil, at its type locality (22°53'36" S, 48°30'04" W) and at 1 km away from there (22°53'16" S, 48°30'23" W) (Martins and Jim 2008). Both sites are at around 900 m altitude. In 2008, Brasileiro *et al.* recorded this species in the Estação Ecológica de Itirapina, municipality of Brotas, state of São Paulo, Brazil (22°12'53" S, 47°54'41" W; 720-750 m altitude), in a "campo sujo" area, near a gallery forest, extending around 105 km northeast to the known distribution of this species.

Recently, Carvalho Jr. *et al.* (2010) recorded *P. moratoi* in the municipality of São Carlos (22°01'00.5" S, 47°56'21.0" W, 810 m), state of São Paulo extending more 22 km south to the known distribution of this species. Such a record was done in an open area of an environment characterized as a mosaic of sugarcane cultivation lands and forest regeneration areas, presenting small islands of remnant native vegetation in a rural landscape.

Here we present a new record of *P. moratoi* for the state of São Paulo in the municipality of Bauru. The collected specimen (Figure 1) was deposited in Jorge Jim Scientific Collection (CCJJ 7857), housed at Departamento de Zoologia, Instituto de Biociências, UNESP, Campus de Botucatu, state of São Paulo, Brazil (License IBAMA/ICMBio - SISBIO 18115-1).

Fieldworks were carried out between November 2008 and January 2009 at Jardim Botânico Municipal de Bauru (22°20'48.46" S, 49°0'56" W; 550 m). This place occupies 321.71 ha and is predominantly composed of

FIGURE 1. Individual of *Proceratophrys moratoi* collected in the Jardim Botânico Municipal de Bauru, Bauru, state of São Paulo, Brazil. Photo by Fábio Maffei.

Cerrado vegetation (*sensu lato*) (Nóbrega and Prado 2008). *Proceratophrys moratoi* specimens were found in a "campo sujo" area, near a fountain, with 30 m extension. Males (n = 4) vocalized during daytime (4-5 p.m.) on a sandy wet ground near the fountain. This water body has slow water drainage, muddy bottom and edges covered by herbaceous vegetation and bushes among some scattered trees. The rivulet is a tributary of the stream Vargem Limpa, which flows through a valley in an open area and is surrounded by vegetation characterized as "cerradão" (forest formation of the Cerrado biome). The stream has sandy bottom and edges covered by herbaceous vegetation and bushes. The largest number of males in vocalization activity was recorded on November 10, 2008 (4 p.m.; 29 °C air temperature; 22 °C water temperature), when 15 specimens were observed. This new record extends to the distribution of *P. moratoi* around 80 km northwestern from its type locality and around 115 km west from that population recorded in the Estação Ecológica de Itirapina (Figure 2).

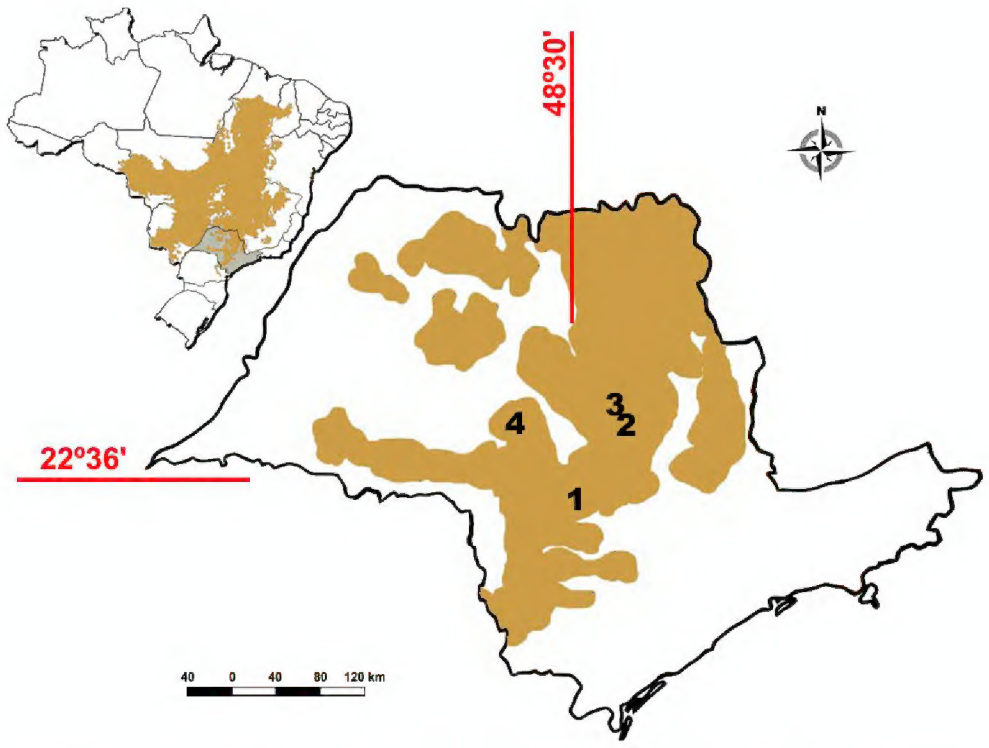

Figure 2. Geographic distribution of *Proceratophrys moratoi* in state of São Paulo, Brazil (1 - type locality, 2 - record of Itirapina, 3 - record of São Carlos, 4 - new record; in brown is the domain of the Cerrado biome).

This occurrence in the municipality of Bauru, at Jardim Botânico Municipal de Bauru is important not only because of the distribution extension, but also because such a place is an Environmental Protection Area (Bauru 1996). In Botucatu region, this species is in decline due to anthropogenic factors and urbanization in the surroundings of the occurrence areas (Martins and Jim 2008; Garcia *et al.* 2009). Thus, the presence of *P. moratoi* populations in protected areas has great importance for the conservation of this species (Brasileiro *et al.* 2008).

Considering the altitude of Botucatu, Itirapina and São Carlos municipalities, the variation in *P. moratoi* occurrence areas ranged from 750 to 900 m (Table 1). The new record significantly increased this amplitude, based on the presence of a population at 550 m altitude, demonstrating the ability of this species to occupy different altitudinal regions. However, the environments of all sites inhabited by *P. moratoi* are very similar as to biotic and abiotic features, especially because they belong to the Cerrado physiognomy "campo sujo". All areas had natural remnants, streams or sources next to vocalization sites, which have sandy soil. Therefore, although this new record showed plasticity in the species distribution in relation to altitude, similarities in the features of the occupied habitats indicate the high specificity of *P. moratoi* for environmental occupation; thus, any change in these environments may cause this species to disappear from such localities.

Brasileiro *et al.* (2008) suggested *P. moratoi* as a "data deficient" species in the Red Lists for Brazil and São Paulo state. These authors and Carvalho Jr. *et al.* (2010) stated that surveys are required to analyze the actual conservation status of this species. The present data agree with the view of those authors, suggesting that new *P. moratoi* populations can be found when the sampling effort is increased in these regions, including the municipality of Bauru.

Table 1. Localities, altitudes, geographic coordinates and references of the records of *Proceratophrys moratoi* in the state of São Paulo.

Localities	Elevation (m)	Localization	References
Botucatu	900	22°53'36"S, 48°30'40"W	Jim and Caramaschi 1980
Brotas	750	22°12'53"S, 47°54'41"W	Brasileiro *et al.* 2008
São Carlos	810	22°01'00"S, 47°56'21"W	Carvalho Jr. *et al.* 2010
Bauru	550	22°20'48"S, 49°00'56"W	current study

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